

CLAIMS

That which is claimed is:

1. An article of apparel comprising a textile with at least one property that changes upon exposure to a physical stimulus, the textile having a modifiable structure formed from yarns that exhibit a dimensional-transformation upon exposure to the physical stimulus, the yarns having a first set of dimensions when unexposed to the physical stimulus, and the yarns having a second set of dimensions when exposed to the physical stimulus, the structure of the textile being modified by exposing the textile to the physical stimulus such that the yarns transform from the first set of dimensions to the second set of dimensions and change the property of the textile.
2. The article of apparel recited in claim 1, wherein the physical stimulus is water.
3. The article of apparel recited in claim 1, wherein the first set of dimensions is less than the second set of dimensions.
4. The article of apparel recited in claim 1, wherein the textile is formed through an interweaving process.
5. The article of apparel recited in claim 4, wherein the yarns define openings in the textile, the openings exhibiting a first area when the yarns are unexposed to the physical stimulus, and the openings exhibiting a second area when the yarns are exposed to the physical stimulus.
6. The article of apparel recited in claim 5, wherein the property of the textile is permeability of the textile.
7. The article of apparel recited in claim 6, wherein the first area is greater than the second area to decrease the permeability of the textile when the yarns are exposed to the physical stimulus.
8. The article of apparel recited in claim 6, wherein the first area is less than the second area to increase the permeability of the textile when the yarns are exposed to the physical stimulus.

9. The article of apparel recited in claim 8, wherein at least a portion of the yarns exhibit an undulating configuration.
10. The article of apparel recited in claim 4, wherein a substantial portion of the textile is formed from the yarn.
11. The article of apparel recited in claim 4, wherein a first portion of the yarns exhibit the dimensional-transformation upon exposure to the physical stimulus, and a second portion of the yarns remain dimensionally-stable upon exposure to the physical stimulus.
12. The article of apparel recited in claim 11, wherein the first portion of the yarns are both weft yarns and warp yarns, and the second portion of the yarns are both weft yarns and warp yarns.
13. The article of apparel recited in claim 11, wherein the first portion of the yarns are one of weft yarns and warp yarns, and the second portion of the yarns are another of weft yarns and warp yarns.
14. The article of apparel recited in claim 1, wherein the textile is formed through an interlooping process.
15. The article of apparel recited in claim 14, wherein the yarns define openings in the textile, the openings exhibiting a first area when the yarns are unexposed to the physical stimulus, and the openings exhibiting a second area when the yarns are exposed to the physical stimulus.
16. The article of apparel recited in claim 1, wherein the first area is less than the second area to increase the permeability when the yarns are exposed to the physical stimulus.

17. The article of apparel recited in claim 1, wherein the structure of the textile exhibits a first texture when the yarns are unexposed to the physical stimulus, and the structure of the textile exhibits a second texture when the yarns are exposed to the physical stimulus.

18. The article of apparel recited in claim 17, wherein the first texture is smoother than the second texture.

19. The article of apparel recited in claim 17, wherein the second texture includes a plurality of nodes that extend outward from a surface of the textile.

20. An article of apparel comprising a textile with a permeability that changes upon exposure to a physical stimulus, the textile having a plurality of openings defined between yarns that exhibit a dimensional-transformation upon exposure to the physical stimulus, the yarns having a first set of dimensions when unexposed to the physical stimulus, and the yarns having a second set of dimensions when exposed to the physical stimulus, the structure of the textile being modified by exposing the textile to the physical stimulus such that the yarns transform from the first set of dimensions to the second set of dimensions and change the permeability of the textile.

21. The article of apparel recited in claim 20, wherein the physical stimulus is water.

22. The article of apparel recited in claim 20, wherein the textile is formed through an interweaving process.

23. The article of apparel recited in claim 22, wherein the openings decrease in area to decrease the permeability of the textile when the yarns are exposed to the physical stimulus.

24. The article of apparel recited in claim 22, wherein the openings increase in area to increase the permeability of the textile when the yarns are exposed to the physical stimulus.

25. The article of apparel recited in claim 24, wherein at least a portion of the yarns exhibit an undulating configuration.

26. The article of apparel recited in claim 20, wherein a substantial portion of the textile is formed from the yarn.
27. The article of apparel recited in claim 20, wherein a first portion of the yarns exhibit the dimensional-transformation upon exposure to the physical stimulus, and a second portion of the yarns remain dimensionally-stable upon exposure to the physical stimulus.
28. The article of apparel recited in claim 20, wherein the textile is formed through an interlooping process.
29. The article of apparel recited in claim 20, wherein the textile exhibits a first texture when the yarns are unexposed to the physical stimulus, and the textile exhibits a second texture when the yarns are exposed to the physical stimulus.
30. The article of apparel recited in claim 29, wherein the first texture is smoother than the second texture.
31. The article of apparel recited in claim 29, wherein the second texture includes a plurality of nodes that extend outward from a surface of the textile.
32. An article of apparel at least partially formed from an interwoven textile, the textile comprising:
a first yarn that exhibits a dimensional-transformation upon exposure to water; and
a second yarn that is substantially dimensionally-stable upon exposure to the water,
wherein the textile is formed by mechanically-manipulating the first yarn and the second yarn, the textile exhibiting a first structure when unexposed to the water, and the textile exhibiting the second structure when exposed to the water due to the dimensional-transformation of the first yarn.

33. The article of apparel recited in claim 32, wherein the dimensional-transformation of the first yarn increases dimensions of the first yarn.

34. The article of apparel recited in claim 32, wherein the first yarn and the second yarn define openings in the textile, the openings exhibiting a first area when the first yarn and the second yarn are unexposed to the water, and the openings exhibiting a second area when the first yarn and the second yarn are exposed to the water to modify the structure of the textile.

35. The article of apparel recited in claim 34, wherein the first area is greater than the second area to decrease a permeability of the textile when the first yarn and the second yarn are exposed to the water.

36. The article of apparel recited in claim 34, wherein the first area is less than the second area to increase a permeability of the textile when the first yarn and the second yarn are exposed to the water.

37. The article of apparel recited in claim 36, wherein at least a portion of the yarns exhibit an undulating configuration.

38. The article of apparel recited in claim 32, wherein the first yarn is both weft yarns and warp yarns, and the second yarn is both weft yarns and warp yarns.

39. The article of apparel recited in claim 32, wherein the first yarn is one of weft yarns and warp yarns, and the second yarn is another of weft yarns and warp yarns.

40. An article of apparel at least partially formed from an interlooped textile, the textile comprising a yarn that exhibits a dimensional-transformation upon exposure to water, the yarn having a first set of dimensions when unexposed to the water, and the yarn having a second set of dimensions when exposed to the water, a structure of the textile being modified by exposing the textile to the water such that the yarns transform from the first set of dimensions to the second set of dimensions and change a permeability of the textile.

41. The article of apparel recited in claim 40, wherein the yarn defines openings in the textile, the openings exhibiting a first area when the yarn is unexposed to the water, and the openings exhibiting a second area when the yarn is exposed to the water to modify the structure of the textile.

42. The article of apparel recited in claim 41, wherein the first area is less than the second area to increase the permeability of the textile when the yarns are exposed to the water.

43. The article of apparel recited in claim 40, wherein the structure of the textile exhibits a first texture when the yarn is unexposed to the water, and the structure of the textile exhibits a second texture when the yarn is exposed to the water to modify the structure of the textile.

44. The article of apparel recited in claim 43, wherein the first texture is smoother than the second texture.

45. The article of apparel recited in claim 43, wherein the second texture includes a plurality of nodes that extend outward from a surface of the textile.

46. An article of apparel at least partially formed from an interlooped textile, the textile comprising:

a first yarn that exhibits a dimensional-transformation upon exposure to water, the first yarn having a first set of dimensions when unexposed to the water, and the first yarn having a second set of dimensions when exposed to the water; and

a second yarn that is substantially dimensionally-stable upon exposure to the water, the textile having a first surface and an opposite second surface, the first yarn being substantially concentrated at the first surface, a structure of the textile being modified by exposing the textile to the water such that the first yarn transform from the first set of dimensions to the second set of dimensions to form a plurality of nodes on the first surface.

47. The article of apparel recited in claim 46, wherein the first yarn and the second yarn are mechanically-manipulated to form a double knit structure.

48. The article of apparel recited in claim 46, wherein the second texture includes a plurality of nodes that extend outward from a surface of the textile.

49. The article of apparel recited in claim 46, wherein the nodes impart a texture to the textile on the first surface.

50. An article of apparel at least partially formed from an interwoven textile, the textile comprising:

a first yarn that exhibits an increasing dimensional-transformation upon exposure to water; and

a second yarn that is substantially dimensionally-stable upon exposure to the water, wherein the textile is formed by mechanically-manipulating the yarns to form a plurality of openings between the yarns, the openings having a first area when the yarns are unexposed to the water, and the openings having a second area when the yarns are exposed to the water due to the dimensional-transformation of the first yarn, the second area being greater than the first area to increase a permeability of the textile.

51. The article of apparel recited in claim 50, wherein at least a portion of the yarns exhibit an undulating configuration.

52. The article of apparel recited in claim 50, wherein the first yarn is both weft yarns and warp yarns, and the second yarn is both weft yarns and warp yarns.

53. The article of apparel recited in claim 50, wherein the first yarn is one of weft yarns and warp yarns, and the second yarn is another of weft yarns and warp yarns.

54. A method of manufacturing an article of apparel from a textile, the method comprising steps of:

selecting a first yarn with a first degree of water absorbency and a first degree of dimensional-transformation upon exposure to water;
selecting a second yarn with a second degree of water absorbency and a second degree of dimensional-transformation upon exposure to the water;
mechanically-manipulating the first yarn and the second yarn to form a textile with a structure that is modified from a first structure to a second structure upon exposure to the water to change a property of the textile.